



[6450-01-P]

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

[Case No. RF-042]

**Decision and Order Granting a Waiver to GE Appliances from the Department of Energy
Residential Refrigerator and Refrigerator-Freezer Test Procedures**

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Decision and Order.

SUMMARY: The U.S. Department of Energy (DOE) gives notice of the decision and order in Case No. RF-042 that grants to GE Appliances (GE) a waiver from the DOE electric refrigerator and refrigerator-freezer test procedures for determining the energy consumption of the specific residential refrigerator-freezer basic models set forth in GE's petition for waiver. Under today's decision and order, GE shall be required to test and rate these refrigerator-freezer basic models, which use dual compressors, using an alternate test procedure that takes this technology into account when measuring energy consumption.

DATES: This Decision and Order is effective **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

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SUPPLEMENTARY INFORMATION: DOE gives notice of the issuance of its decision and order as set forth below. The decision and order grants GE a waiver from the applicable residential refrigerator and refrigerator-freezer test procedures found in 10 CFR part 430, subpart B, appendix A for certain basic models of refrigerator-freezers with dual compressors, provided that GE tests and rates such products using the alternate test procedure described in this notice. Today's decision prohibits GE from making representations concerning the energy efficiency of these products unless the product has been tested in a manner consistent with the provisions and restrictions in the alternate test procedure set forth in the decision and order below, and the representations fairly disclose the test results.

Distributors, retailers, and private labelers are held to the same standard when making representations regarding the energy efficiency of these products.

Issued in Washington, DC, on February 6, 2015.

Kathleen B. Hogan,
Deputy Assistant Secretary for Energy Efficiency,
Energy Efficiency and Renewable Energy.

Decision and Order

In the Matter of: GE Appliances (Case No. RF-042)

I. Background and Authority

Title III, Part B of the Energy Policy and Conservation Act of 1975 (EPCA), Pub. L. 94-163 (42 U.S.C. 6291-6309, as codified) established the Energy Conservation Program for Consumer Products Other Than Automobiles, a program covering most major household appliances, which includes the residential electric refrigerators and refrigerator-freezers that are the focus of this notice.¹ Part B includes definitions, test procedures, labeling provisions, energy conservation standards, and the authority to require information and reports from manufacturers. Further, Part B authorizes the Secretary of Energy to prescribe test procedures that are reasonably designed to produce results measuring energy efficiency, energy use, or estimated operating costs, and that are not unduly burdensome to conduct. (42 U.S.C. 6293(b)(3)) The test procedure for residential electric refrigerators and refrigerator-freezers is set forth in 10 CFR part 430, subpart B, appendix A.

The regulations set forth in 10 CFR 430.27 contain provisions that enable a person to seek a waiver from the test procedure requirements for covered products. DOE will grant a waiver if it is determined that the basic model for which the petition for waiver was submitted contains one or more design characteristics that prevents testing of the basic model according to the prescribed test procedures, or if the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. 10 CFR 430.27(f)(2). Petitioners must include in their

¹ For editorial reasons, upon codification in the U.S. Code, Part B was re-designated Part A.

petition any alternate test procedures known to the petitioner to evaluate the basic model in a manner representative of its energy consumption. The Assistant Secretary may grant the waiver subject to conditions, including adherence to alternate test procedures. 10 CFR 430.27(f)(2). Waivers remain in effect pursuant to the provisions of 10 CFR 430.27(l).

DOE also may grant a petitioning manufacturer with an interim waiver from the test procedure requirements when such relief is sought. 10 CFR 430.27(e)(2). Within one year of issuance of an interim waiver, DOE will either: (i) publish in the Federal Register a determination on the petition for waiver; or (ii) publish in the Federal Register a new or amended test procedure that addresses the issues presented in the waiver. 10 CFR 430.27(h)(1). When DOE amends the test procedure to address the issues presented in a waiver, the waiver will automatically terminate on the date on which use of that test procedure is required to demonstrate compliance. 10 CFR 430.27(h)(2).

II. *GE's Petition for Waiver: Assertions and Determinations*

On June 27, 2014, GE submitted a petition for waiver from the test procedure applicable to residential electric refrigerators and refrigerator-freezers set forth in 10 CFR part 430, subpart B, appendix A. See 79 FR 55775 (Sept. 17, 2014). GE is seeking a waiver because it is developing new refrigerator-freezers that incorporate a dual-compressor design that GE believes is not properly accounted for in DOE's final rule published on April 21, 2014 (78 FR 22320), which amended the test procedure for refrigerators and refrigerator freezers in Appendix A. In its petition, GE seeks a waiver from the new DOE test procedure applicable to refrigerators and refrigerator-freezers under 10 CFR part 430 for two dual-compressor system basic models.

Information provided by GE indicate that these basic models demonstrate non-uniform cycling of their compressors, which prevents the verification of two criteria in the Appendix A test procedure—to ensure (a) that the first part of the test comprises a period of stable operation, and (b) that the second part of the test (used to measure the energy use contribution of the defrost cycle(s)) both starts and ends during periods of stable operation.

DOE previously granted a similar waiver to GE through a Decision and Order (78 FR 38699 (June 27, 2013)) under Case No. RF-029 pertaining to 10 CFR part 430, subpart B, appendix A1. DOE also granted similar waivers to Sub-Zero (77 FR 5784 (February 6, 2012)), LG (77 FR 18327 (March 26, 2013)); and Samsung (78 FR 35899 (June 14, 2013)) and (79 FR 19884 (April 10, 2014)).

In its April 2014 final rule, DOE incorporated provisions to address the testing of products with multiple compressors, which were intended to obviate the need for waivers for multiple-compressor products such as the ones previously granted to GE and others, if these products are tested using the new Appendix A. However, in its petition for waiver, GE contended that due to certain characteristics of the basic models listed in the petition, the Appendix A test procedure does not accurately measure the energy consumption of these basic models. Specifically, GE claimed that requirements in the Appendix A test procedure that were included to ensure (a) that the first part of the test comprise a period of stable operation, and (b) that the second part of the test (used to measure the energy use contribution of the defrost cycle(s)) both starts and ends during periods of stable operation—cannot be applied to these

basic models, because their compressor cycles do not repeat uniformly, which is one of the assumptions built into the test procedure.

In lieu of using Appendix A, GE has submitted an alternate test procedure to account for the energy consumption of its refrigerator-freezer models with dual compressors. GE's alternative test is essentially the same as the test for multiple-compressor products with automatic defrost in section 4.2.3 of Appendix A, except that: (a) the test period for the first part of the test would not be required to meet the requirements for evaluating stable operation provided in section 1.22 of Appendix A; (b) the second part of the test would have a minimum duration—this would be at least 24 hours, unless a second defrost (other than the target defrost captured within the test period) occurs before the end of 24 hours, in which case, the test period duration would be at least 18 hours; (c) the start of the second part of the test would occur “at the end of a regular freezer compressor on-cycle after the previous defrost occurrence” rather than during a period of stable operation as defined in section 1.22 of Appendix A; and (d) the end of the second part of the test would occur “at the end of a freezer compressor on-cycle before the next defrost occurrence” rather than during a period of stable operation as defined in section 1.22 of Appendix A.

GE believes its alternate test procedure will allow for the accurate measurement of the energy use of these products, which GE contends is not achieved by the current Appendix A test procedure. Specifically, due to the non-uniform compressor cycles of this product, which prevent consistent application of the requirements provided in section 1.22 of Appendix A for evaluating the stable operation of a tested unit, the alternative test would not explicitly impose these stable

operation requirements. Based on the information provided by GE, the variation in test results associated with different selections of test periods would be insignificant as long as the test starts after the 24-hour stabilization period, which is required both by the Appendix A test procedure and the alternative test procedure suggested by GE. Further, GE's alternative test's minimum duration for the second part of the test would also not significantly affect the results.

Although not explicitly stated in the alternative test method, or in GE's petition, DOE understands the term "stable operation" used in the petition to have a different meaning than the same term as used in Appendix A, since the alternative test method does not use the same stability criteria. In this case, DOE understands "stable operation" to mean operation after steady-state conditions have been achieved but excluding any defrost cycles or events associated with a defrost cycle, such as precooling or recovery, and that this term would apply in the same way for the first and second parts of the test. DOE understands the term also to mean operation in which the average rate of change of compartment temperatures is zero or very close to zero. These temperatures may fluctuate around representative average temperatures as the compressors cycle on and off, but over several compressor cycles, these average compartment temperatures would not significantly change. The key difference in this interpretation of stable operation as compared with the definition in Appendix A is that it involves neither assignment of a specific maximum rate of change of the average temperature nor specification of a method to verify that operation is stable. DOE further notes that this particular use of the term "stable operation" is limited solely to the basic models that are the subject of this waiver, as DOE has verified using information provided by GE about the actual operational characteristics of these models that such a test is appropriate in this limited case.

GE also requested an interim waiver from the existing DOE test procedure, which DOE granted. See 79 FR 55776. An interim waiver may be granted if it is determined that the applicant will experience economic hardship if the application for interim waiver is denied, if it appears likely that the petition for waiver will be granted, and/or the Assistant Secretary determines that it would be desirable for public policy reasons to grant immediate relief pending a determination of the petition for waiver. See 10 CFR 430.27(e)(2).

As noted previously, DOE recently addressed multiple compressor products in its April 21, 2014 final rule. In considering GE's petition for waiver, DOE sought additional details about the specific operating characteristics of the products that are the subject of the petition in order to determine whether they cannot be tested using the section of the amended test procedure that was adopted specifically to address such products. GE indicated in its petition that the compressors serving the fresh food and freezer compartments of these models have non-synchronous cycles that do not repeat uniformly, which prevents these models from achieving the temperature stability conditions specified in the Appendix A test procedure. To better understand GE's claim and the issues raised in the petition, DOE requested data regarding the operational characteristics of these products, which GE provided. DOE was specifically concerned that the use of GE's proposed test method could present the risk of truncation error in the energy use measurement or the possibility of variation between separate tests of the same unit due to temperature drift in the compartments or differences in the operational state of the compressors at the beginning or end of the test period. The data provided by GE indicated that these models demonstrate non-uniform cycling that makes direct use of the Appendix A requirements for evaluating temperature

stability problematic—these requirements may be appropriate for some operating modes of the basic models, but not for other operating modes. The data also showed that the use of GE’s proposed test method is unlikely to result in significant variation in test measurements for these particular models on the basis of the selected test period. DOE notes, however, that these conclusions are limited to the models listed in GE’s petition based upon the data provided by GE and that other basic models may demonstrate operating characteristics that differ from these models, making this alternative test method inappropriate for measuring their energy use. Should DOE receive petitions for waiver requesting use of the alternative test identified in this notice for other basic models, DOE may request from the manufacturer information about the operation of those basic models that would demonstrate that their energy use can be accurately measured using this alternative test and that such models cannot in fact be tested using the currently assigned test method in Appendix A.

DOE has reviewed the alternate procedure and believes that it will allow for the accurate measurement of the energy use of these products, while alleviating the testing problems associated with GE’s implementation of a dual compressor system. DOE did not receive any comments on the GE petition.

III. *Consultations with Other Agencies*

DOE consulted with the Federal Trade Commission (FTC) staff concerning the GE petition for waiver. The FTC staff did not have any objections to granting a waiver to GE.

IV. *Conclusion*

After careful consideration of all the material that was submitted by GE and consultation with the FTC staff, it is ordered that:

(1) The petition for waiver submitted by GE Appliances (Case No. RF-042) is hereby granted as set forth in the paragraphs below.

(2) GE shall be required to test and rate the following GE models according to the alternate test procedure set forth in paragraph (3) of this section.

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ZIK30*****

(3) GE shall be required to test the products listed in paragraph (2) above according to the test procedures for electric refrigerator-freezers prescribed by DOE at 10 CFR part 430, appendix A, except that, for the GE products listed in paragraph (2) of this section only, the energy consumption shall be determined as follows:

$$ET = (1440 \times EP1/T1) + \sum_{i=1}^D [(EP2_i - (EP1 \times T2_i/T1)) \times (12/CT_i)]$$

Where:

- ET is the test cycle energy (kWh/day);
- 1440 = number of minutes in a day

- EP1 is the dual compressor energy expended during the first part of the test (If at least one compressor cycles, the test period for the first part of the test shall include a whole number of complete primary compressor cycles comprising at least 24 hours of stable operation, unless a defrost occurs prior to completion of 24 hours of stable operation, in which case the first part of the test shall include a whole number of complete primary compressor cycles comprising at least 18 hours of stable operation);

- T1 is the length of time for EP1 (minutes);

- D is the total number of compartments with distinct defrost systems;

- i is the variable that equals to 1, 2 or more that identifies the compartment with distinct defrost system;

- EP2i is the total energy consumed during the second (defrost) part of the test being conducted for compartment i. (kWh);

- T2i is the length of time (minutes) for the second (defrost) part of the test being conducted for compartment i.

- 12 = conversion factor to adjust for a 50% run-time of the compressor in hours/day

- CTi is the compressor on time between defrosts for only compartment i. CTi for compartment i with long time automatic defrost system is calculated as per 10 CFR part 430, Subpart B, Appendix A clause 5.2.1.2. CTi for compartment i with variable defrost system is calculated as per 10 CFR part 430 subpart B, Appendix A clause 5.2.1.3. (hours rounded to the nearest tenth of an hour).

Stabilization:

The test shall start after a minimum 24 hours stabilization run for each temperature control setting.

Test Period for EP2i, T2i:

EP2i includes precool, defrost, and recovery time for compartment i, as well as sufficient dual compressor cycles to allow T2i to be at least 24 hours, unless a defrost occurs prior to completion of 24 hours, in which case the second part of the test shall include a whole number of complete primary compressor cycles comprising at least 18 hours. The test period shall start at the end of a regular freezer compressor on-cycle after the previous defrost occurrence (refrigerator or freezer). The test period also includes the target defrost and following freezer compressor cycles, ending at the end of a freezer compressor on-cycle before the next defrost occurrence (refrigerator or freezer).

Test Measurement Frequency:

Measurements shall be taken at regular interval not exceeding 1 minute.

(4) Representations. GE may make representations about the energy use of its dual compressor refrigerator-freezer products for compliance, marketing, or other purposes only to the extent that such products have been tested in accordance with the provisions outlined above and such representations fairly disclose the results of such testing.

(5) This waiver shall remain in effect consistent with the provisions of 10 CFR 430.27(l).

(6) This waiver is issued on the condition that the statements, representations, and documentary materials provided by the petitioner are valid. DOE may revoke or modify this waiver at any time if it determines the factual basis underlying the petition for waiver is incorrect, or the results from the alternate test procedure are unrepresentative of the basic models' true energy consumption characteristics.

(7) This waiver applies only to those basic models set out in GE's June 27, 2014 petition for waiver. Grant of this waiver does not release a petitioner from the certification requirements set forth at 10 CFR part 429.

Issued in Washington, DC, on February 6, 2015

Kathleen B. Hogan
Deputy Assistant Secretary for Energy Efficiency
Energy Efficiency and Renewable Energy

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